independently of whether one chooses higher or lower chambers, and, therefore, the total amount of the buoyancy is determined only by the useful height of the chimney, whilst the arrangement of the individual portions of the passage of the gas in the interior of the furnace system must be without importance, and therefore can be chosen according to fancy. The easy passage of the gases admits of a pressure in the entire furnace system rapidly equalising, and as the share of the chimney draught on the total buoyancy is by far the greatest, the gases must be thereby drawn through the entire furnace system.

But in reality the conditions are otherwise. H. H. Campbell expresses himself on this question in his book as follows:—

" Both gas and air should enter the combustion chamber under a positive force, forcing them into contact with each other and throwing the resultant flame across the furnace in such a way that the draught of the stack on the outgoing end can pull it down through the ports without its impinging on the roof.

" A prevalent idea among furnace men is that the draught of the stack pulls the gases into the furnace ; but this is entirely wrong. They are not pulled; they are pushed in by the upward force of the white-hot vertical port at the incoming end."

The correctness of the foregoing view is evident if one observes that, in addition to the buoyancy, a second condition influences the movement of the gases, and this is formed by the resistances which arise from the motion of the gases and are rendered sensible in that they obstruct these. These resistances, however, oppose themselves to an equalisation of pressure.

Now, in the open-hearth furnace, it is not possible to completely shut off the combustion chamber from the atmosphere, and if one were to be able to imagine that one could avoid leaky places by sealing the charging doors, there would still remain the necessity to frequently open these doors for the purpose of control and regulation of events in the combustion chamber. Therefore phenomena must appear, as would be the case if a current of any fluid were passed through a system